# Development of a CD-ROM Retrieval System for the DDESB Seminar Abstracts

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## Abstract

The original mainframe, on-line, text-based retrieval system for the citations of papers presented at the Department of Defense Explosives Safety Board (DDESB) Safety Seminars has been replaced with a user-friendly CD-ROM retrieval system. The text-based retrieval software, which runs on IBM-compatible PCs, offers an easy-to-use interface and duplicates the functionality of the on-line system. Searchable data includes the abstracts, bibliographic citations and subject indexes for every paper. All fields in the text-based system are searchable, permitting very specific search strategies to be invoked, resulting in high recall and relevancy rates for the search output. Current plans call for the release of a public access version of the CD-ROM retrieval system through NTIS.

## Introduction

As reported at the August 1992 Safety Seminar, CPIA developed an on-line text-based retrieval system for the DDESB Safety Seminar proceedings and CPIA's archives. This system, named the Propulsion Information Retrieval System (PIRS), was accessible by modem on the IBM mainframe computer at the JHU Applied Physics Laboratory. This system was replaced about a year ago by a PC-based system of comparable functionality, operating at much lower cost. PC prices have significantly dropped in recent years, while at the same time the storage capacity and performance of these systems have grown tremendously, permitting cost-effective storage of large databases on PCs. In addition, text-based retrieval software compatible with the existing system was available. Soon after the PC text-retrieval system was implemented. CPIA developed a CD-ROM version of its text-based management system. This was accomplished at relatively low cost aided by the availability of relatively inexpensive, easy to use CD-ROM writable technology, enabling in-house CD-ROM production. The storage capacity of CD-ROM along with the growing affordability and availability of CD-ROM readers made the use of CDs as a distribution mechanism an easy choice. A brief description of the system is presented.

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**Retrieval System Development**

System Goals and Architecture

The major goal of the project was to reduce the costs associated with the retrieval of the seminar paper citations and CPIA's retrieval system. A subsidiary goal was to improve the ease of maintenance, use and modification of the retrieval system. Specific system requirements were as follows:

- provide capabilities comparable to the previous on-line system,
- permit easy access to the DDESB and CPIA technical papers and report citations,
- provide the means to query the full text of terms and phrases within the titles, abstracts, and subject term fields,
- provide for output to a printer, and
- enable an efficient and easy to use interface through menus and help screens.

System Description

The system's record structure is basically unchanged from the mainframe-based on-line system. Search capabilities have been enhanced by the new software, in terms of flexibility and field specificity. The interface is markedly improved and removes some of the cumbersome qualities of the on-line system.

System Requirements -

The system software will run on rather average equipment by modern standards. To install and operate PIRS, one needs the following equipment:

- IBM-compatible computer with at least an 80386 processor with hard disk;
- MS-DOS operating system software, Version 3.0 or higher;
- At least 5 megabytes of available hard disk storage; 10 megabytes preferred;
- At least 512 kilobytes of available random access memory (RAM);
- VGA color monitor preferred, but not required;
- ISO 9660 compatible CD-ROM drive (a 3x CD-ROM drive is strongly recommended to improve access time for those accessing through CD-ROM); and
- Laserjet, ink jet, or bubble-jet printers preferred, but not required.

CD-ROM System Operation -

The CD-ROM version of PIRS has an automated installation facility which loads necessary files and subdirectories onto the host system's hard drive. After installation of the PIRS data, the user would type the characters "**PIRS"** . The PIRS welcome screens will then appear. These initial screens contain contact names and phone numbers, and give security information prior to the display of the search entry screen.

Searching -

The next screen that appears is the search screen, which is the main screen through which all system functions are performed. Numerous help screen are available from the main search screen to aid users in developing, entering, and executing search strategies. A search strategy is a term (word or phrase) or a list of terms connected to each other by one or more operators. The operators are either Boolean (or, and, not) or positional (adj, near, same, with). Searches can be performed on terms, sets, or a combination of terms and sets. A set is a temporary record of the results of a previous search strategy.

Examples of simple search strategies are shown below:

1. **propellant or explosive**

2. **electrostatic hazard or ESD**

3. **2 and 1**

In set 1, all instances of the word **propellant** or **explosive** will be searched. In set 2, **electrostatic hazard** and the acronym, **ESD**, are searched. Finally, in set 3 the search is completed by combing sets 2 and 1 through the AND operator.

PIRS CD-ROM document citations are subdivided into fields containing specific types of bibliographic information (report title, author, source organization, etc.). PIRS CD-ROM searches all fields unless, specifically limited to a particular field. This feature is particularly useful for limiting the search to a particular period of time.

Displaying -

The DISPLAY option permits a user to display, review, and print the output of your last search. The document citations will be displayed on screen one at a time in reverse abstract number order, with the most recent document citations appearing first. The DISPLAY feature also has option for printing the results of a search.

Other Search Features:

Wild Cards -

Pattern matching or wild card features in the PIRS search system provides a retrieval method of search terms with common root strings. The wild card characters are an asterisk (*) and a question mark (?). The '*' represents any number of characters while the '?' represents a single character. For example, the search term **propellant*** would produce search terms such as propellant, propellants, propellant-A, propellant-test, etc.

A character restriction can be placed on a pattern matching wild card by appending a number after the wild card. For, example the search term **propellant*1** would produce search terms

such as propellant and propellants. As shown, this character restriction feature can be a useful tool in providing both single and plural search terms, provided the plural terms are produced by adding the letter s to the end of the single term.

Indexing a Word Stem -

The INDEX [ ] option allows the user to enter the stem of a term of interest. PIRS CD-ROM will display the words in the database that start with the stem, along with the number of document citations that contain those words. The system assigns reference numbers to each citation so that one can use the reference number to create a search.

CD-ROM Status

The unclassified, limited distribution version of the PIRS CD-ROM contains over 50,000 citations of DoD, military services, NASA, contractor reports, and DDESB Seminar, JANNAF and AIAA conference papers covering 25 years of propulsion technology. Over 1,600 of these are from the DDESB Seminar Meetings dating from 1959 to 1992. The CD-ROM version of PIRS is updated bi-annually with newly acquired documents and meeting proceedings. Since this version cites classified and limited documents, an unclassified/unlimited-distribution version of PIRS was also developed. This version contains over 17,600 citations, includes all of the DDESB Seminar Meeting papers, and is available to the general public from the CPIA and in the near future from NTIS.

**Summary**

CPIA has developed a computerized system for retrieving technical report citations using CD-ROM technology that is relatively easy and uncomplicated to use. The PIRS CD-ROM provides quick access to over 25 years worth of document records related to missile, space, and gun research and technology. This system offers a powerful tool for accessing the results of past research, at a relatively low cost.

**References**


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